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Automatic
Control and
Systems
Engineering

The Department of Automatic Control & Systems Engineering
is pleased to announce the following joint seminar:

**Experimental investigation on double-impulse phenomenon of hybrid ceramic ball bearing
with outer race spall**

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Wednesday, 28 September 2016 at 14:00

LT02, Sir Henry Stephenson Building

Abstract

Previous reports indicated that a double-impulse train can be observed in the vibration generated by a spalled ball bearing. The double impulses consist of two parts, the step response and the impulse response, which will be occurred when a rolling element is entering and exiting the spall zone, respectively. Precise measurement of the space between the two parts can be employed to estimate the length of the spall zone along the rotating direction, and provide a possibility to evaluate the remaining useful life (RUL) of faulty bearings under running conditions. However, all the previous works are only concerned with the metal ball bearings. The double-impulse phenomenon generated by faulty hybrid ceramic ball bearings is rarely reported. To address this issue, the double-impulse phenomenon of hybrid ceramic ball bearings with different spall sizes on their outer races will be investigated in this study. The pre-whitening, kurtogram and squared envelop are employed to extract the two events (the entry and the exit) from the picked vibration. Experimental results indicate that the hybrid ceramic ball bearing with an outer race spall can generate shaper double-impulse phenomenon than that from the faulty metal bearings with almost the same outer race spall size.

Biography

Yu Guo received Ph.D. degree in Mechanical Engineering from Chongqing University, Chongqing, China, in 2003. Now he is a Professor of the Faculty of Mechanical and Electrical Engineering in Kunming University of Science and Technology, China. His current research interests include signal processing methods, dynamics and fault diagnosis.

*Light refreshments will be served in the
foyer of the Sir Henry Stephenson Building following the seminar*